

Wednesday  
March 4, 1992



Published by

# Daily SNAP

Soviet News Abstracts Publication

## FOREIGN TECHNOLOGY CENTER

**Author:** *Khokhlov, A. (interviewer)*  
**Title:** DEFENSE INDUSTRY SEEKS SHARE OF PROCEEDS FROM EXPORT OF WEAPONS

**Primary Source:** *Komsomolskaya pravda*, February 8, 1992, Nos. 31-32 (20331-20332), p. 2, cols. 5-8

**Extract:** Viktor Konstantinovich Glukhikh, a head of the military-industrial complex, thinks that Russia could sell 15 to 30 billion dollars' worth of weapons a year.

"During the pre-perestroika years, the USSR sold, on the average, armaments in the amount of 18 billion dollars a year on the world market [he said]."

"How much has the selling of weapons been reduced?"

"By several times. The Ministry of Industry of Russia and the Ministry of Foreign Affairs are making efforts to regain our positions on the world market."

"What kinds of weapons are in greatest demand?"

"Along with the United States, France, England and Germany, we are among the five countries that are capable of producing weapons of any class and level. Most eagerly bought from Russia are Mig-29, Mig-31 and Su-27 airplanes, T-72 tanks, guided antitank missiles, Kalashnikov submachine guns, ammunition .... There are hundreds of kinds and types of equipment, weapons and ammunition, which are competitive with and sometimes even surpass foreign models."

"Three-fourths of the defense complex of the former USSR went to Russia. This involves 1,500 defense enterprises and more than 900 research institutes and design bureaus. The total number of people employed is about 9 million, 1.7 million of whom are working at research institutes and design bureaus. We are not free-loading on the people. In 1991, more than 60 percent of the production of the military-industrial complex was made up of consumer goods and other civilian products. Every second

defense-industry employee was working for peace rather than for war.

"Yes, we want to survive. The government has practically stopped budget financing and did not provide money for conversion. During the last 2 years, we have been converting 30 percent of capacity each. And we are still alive. Money from the sale of weapons will be targeted for conversion of the defense complex. By the way, negotiations about this are already under way with the American side."

"The state gets 40 percent of the transaction sum from sales. It can use this amount as it deems necessary. The rest goes to the producers. The productive assets of the military-industrial complex constitute about six percent of the country's industrial potential, and would it be right for the sake of immediate goals to squander this part of our country's wealth?"

"Interference of politicians in the arms trade must be minimal: the formulation of overall directions. To whom to sell and for how much, that must be decided by specialists -- defense personnel and diplomats. The main thing is not to do harm to ourselves by arming potential geopolitical rivals, not to supply arms to 'hot spots,' and to obtain maximum profits for Russia. All this -- under strict state supervision."

"What will Russia never trade with?"

"The latest developments, and precision weapons technologies, especially nuclear ones."

(SNAP 920304)

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**Author:** *Krivomazov, Nikolay*  
**Title:** NUCLEAR SPACECRAFT-ENGINE DEVELOPERS SEEK NEW SOURCES OF INCOME

**Primary Source:** *Pravda*, February 11, 1992, No. 33 (26787), p. 1, cols. 3-7

**Extract:** A laboratory of the Institute imeni Kurchatov is making preparations for a mission to Mars, about which, one may remember, the first and last President of the USSR began talks with the Americans for the first time.

I talked with the bright people who invented a nuclear engine for space flights, an engine that is at least five years ahead of the American one.

Our 'product' is no being run on American test stands. For dollars. For those dollars, the physicists will be able to do more than repair their [broken] faucets and worn-out chairs. It is expected that infusions of money will give this brain a second and third lease on life.

(Two photographs are given showing V. Koryukin, B. Semenov and Yu. Nechayev working in the department of high-temperature power engineering; and the "Ikar" critical testing stand.)  
(SNAP 920304)

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**Author:** Chernenko, V., Candidate of Medical Sciences, senior project science associate of the State Scientific Research Institute of Civil Aviation

**Title:** WORK ON NEW RADIATION-SAFETY NORMS FOR FLIGHT PERSONNEL HALTED

**Primary Source:** *Vozdushnyy transport*, February 1992, No. 7 (2087), p. 9, cols. 3-5

**Extract:** Norms of radiation safety are in effect in our country. A radiation dose of 5 rem per year is permitted for personnel of nuclear power stations or persons in category "A." This norm is for the category of so-called "irradiated" persons -- technical personnel, and operators who work directly in zones of heightened radiation at nuclear stations. For persons living near sources of radiation (category "B"), this figure is one-tenth as high. These norms are now being revised in the direction of greater rigidity. For all the rest of the citizenry, the norm is 0.04 to 0.1 rem (which is the amount that we may receive in a whole year, including irradiation resulting from various medical procedures).

Judging by results of dosimetric studies which were conducted on 310 flights in

1991, pilots receive from 0.3 to 0.9 rem per year while spending 700 hours in the air.

Some types of airplanes are equipped with radiation monitors, but they are extremely imperfect. Radiation monitors on TU-134 and IL-62 airplanes detect only high doses of irradiation, beginning with a "roentgen," which are possible only during sudden solar flare-ups and heightening of solar activity. Not a single Soviet radiation monitor is specified for making measurements at an altitude.

There has been almost no study of effects which small doses of radiation produce on the human organism. About 10 years ago, scientists of our institute gathered and systematized information on [cancer] illness rates of flight personnel; very large figures were obtained, but we were not allowed to publish them.

Our latest work is aimed at formulating new radiation-safety norms for flight personnel and making pilots equivalent to category "A" of irradiated persons. On the basis of new norms, changes in conditions of the work and leisure time of crews can be insisted on; airplanes can be equipped with more sensitive radiation monitors, including individual ones, on routes above 60 degrees North latitude; and it can be recommended that crews fly on levels no higher than 10,000 meters.

But this is a matter for the future. For radiation safety norms to be changed, at least five years of "work on statistics" for years which are different from the standpoint of solar activity will be needed. Unfortunately, our group's work was discontinued in March.

(SNAP 920304)

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**Author:** Kuznetsova, T., engineer of the Aircraft Scientific-Technical Complex imeni Antonov

**Title:** ISOKINETIC AEROSOL SAMPLERS DEVELOPED AT AIRCRAFT DESIGN BUREAU

**Primary Source:** *Vozdushnyy transport*, February 1992, No. 7 (2087), p. 11, col. 5

**Extract:** An instrument developed at the Aircraft Scientific-Technical Complex imeni Antonov identifies what we are breathing.

Among numerous and diverse exhibits, an isokinetic sampler of aerosols (IPA) attracted attention chiefly by virtue of its 'professional' qualities. This exhibition was assembled by the International Association for Rendering Assistance to Victims of the Accident at the Chernobyl Nuclear Power Station and shown at the Republic Center for Exhibitions and Fairs in Kiev.

Research of characteristics of an aerosol is nothing new, generally speaking. Instruments in existence up to now have been equipped with electric drives and have been complicated to operate and unreliable, however. The Antonov complex's IPA is completely self-contained. It operates on the principle of the vacuum cleaner, using the energy of the wind to drive a windwheel which performs the function of an air pump. Moreover, the fact that the instrument is isokinetic (i.e., the speeds of the air flow in the atmosphere and the flow in the instrument's intake canal are identical) enables it to monitor air pollution around the clock with high precision, missing nothing.

In four years of operation, more than 25,000 samples have been taken in a wide range of weather conditions, and data have been obtained on regularities involved in the formation of harmful radiation and ecological conditions. This work has been favorably evaluated by the Ukrainian Academy of Sciences' Institute of Nuclear Research.

There are already more than 100 samplers in the series. They were produced at the Kiev Aircraft Production Association according to plans and specifications from the Antonov designers. A second generation of the instruments has now been developed which is more highly perfected and reliable. A number of European countries have shown interest in the Kiev aircraft designers' development.

As was reported at the design bureau, plans call for use of the IPA in a wider range of its capabilities; in particular, for it to be used as a basic instrument for development of regional ecological monitoring.  
(SNAP 920304)

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Author: Chebotarev, Ye., Meritorious Scientist of Ukraine

Title: BOOK ON EFFECTS OF PROLONGED EXPOSURE TO CHERNOBYL RADIATION

Primary Source: *Pravda Ukrayny*, January 18, 1992, No. 7 (14995), p. 2, col. 5

Extract: Chernobyl and Hiroshima. Two global nuclear disasters .... The book *From Hiroshima to Chernobyl* (Ot Khirosimy do Chernobyla), published by "Naukova dumka" in 1991, by Professor V. A. Baraboy, a Kiev radiobiologist, is essentially the first objective comparison of these terrible events.

How does ionizing radiation work and how does one protect oneself from the lethal, though imperceptible flow of radiation? What happened at Hiroshima and Nagasaki has focused the attention of science on this acute problem, and the author, who has been working in this field for many years, travels an instructive road with his readers. But Chernobyl exposed another facet of the radiation threat: the hidden danger of prolonged external and internal irradiation in low doses, which until recently seemed to be practically harmless. Are there radiation doses that are so low that they are completely harmless? Or does such action have no threshold, being dangerous even at the level of individual particles and quanta of radiation? V. Baraboy is of the opinion that harmless thresholds are only an illusion.

The book opens the series "Chernobyl," which is intended not for some narrow circle of specialists, but for everybody.  
(SNAP 920304)

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Author: Orekhov, T. (Vladivostok)

Title: GAS-HYDRATE FUEL PRODUCTION CALLED ALTERNATIVE TO NUCLEAR POWER

Primary Source: *Sovetskaya Rossiya*, February 7, 1992, No. 26 (10725), p. 2, cols. 3-8

Extract: The Primorskiy Kray Soviet has adopted a decision to build an underground nuclear power station in this kray.\*

Those who support the idea of building a nuclear power station have a considerable number of opponents. One of them is Boris

Fedosovich Titayev, member of the Russian Engineering Academy and general director of the scientific production joint-stock company "Pacific Marine Technologies," who has been studying problems of Far East power engineering for many years.

"Underground nuclear power stations are 2-2.5 times as costly as those above ground, so that implementation of the project will cost a minimum of 10 billion rubles [he said]. It is proposed to install underground a nuclear reactor for submarines -- a creation of the Central Scientific Research Institute imeni Krylov. But, I beg your pardon, the specialists of this institute are far removed from designing underground nuclear power stations. Moreover, from the point of view of reliability and economic efficiency, their merits are, to put it mildly, not indisputable.

"Furthermore, Primorskiy Kray is in a zone of active tectonic activity and faults. Should there be a slight earthquake .... Surveying, designing and building of the proposed nuclear power station will take 8-10 years (rather than 3-4 years, as the authors of the idea assure us)."

"Is there a realistic alternative to the nuclear power station?"

"What is paradoxical about the kray's energy crisis is that we are literally sitting on top of fabulous reserves of fuel resources. What I have in mind is gas hydrate -- a mineral consisting of methane and water in the frozen state. At the bottom of the world's oceans, including the coastal shelves, there is many times more of it than world reserves of coal, petroleum, gas and peat taken together -- not less than 15,000 trillion tons! Moreover, the reserves are practically inexhaustible, since gas hydrate is continuously being formed. When it decomposes, each cubic meter of it yields 150-180 cubic meters of methane and about 800 liters of fresh

water. The studies conducted and the specialized production complexes developed to the technical-drawings stage make it possible to plan the creation of semicommercial facilities for the recovery and processing of gas hydrate at the coast of the Southern Primorye (Maritime Territory), Sakhalin and the Kuril Islands within 18 months to two years. And the cost of commercial underwater facilities, a base ship, a transportation system, management and an on-shore infrastructure will be one-fifth to one-seventh that of a nuclear station and will involve ecologically clean technology.

"Our gas-hydrate program has passed very strict examination in the Russian government and has been accepted for budget funding as a state program. But in the present situation, the government has cannot deal with it. Local governing structures must have a material interest in solving this problem, and such an interest is just what they lack. On the other hand, we have credit offers from Americans, and not only from them. People abroad have quickly become aware of the profitability of gas hydrates."

\*See also the *Daily SNAP*, January 13, 1992, p. 1, col. 1  
(SNAP 920304)

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